VLSI CHIP REPAIR
(FOCUSED ION BEAM (FIB))
Focused Ion Beam (FIB) Repair

• Some key FIB operations:
  – “Drilling down” through layers
  – Cutting specific wires
  – Laying down insulating materials
  – Laying down wires

output?
floating?

two inputs?
Focused Ion Beam (FIB) Repair

FIB intervention with ion beam insulator deposition permitting multi-level fixes and accessing nodes through a power grid

- http://www.nanoscopeservices.com/Nanoblog/?cat=39
- “NanoScope adds a Nano-Surgery flavour to NMI IP Integration Networking Event”
Focused Ion Beam (FIB) Repair

- Specifications from EAG Laboratories
  - Employs a focused Ga+ ion beam to image, etch, and deposit materials
  - 4–5 nm resolution
  - approx. 20 nm accuracy
  - Can deposit tungsten, platinum, or silicon dioxide with appropriate gas chemistries
- Looks like approx. 12 metal pitches in 15 µm → lambda approx. 0.18 µm which implies a 0.35 µm technology